(No Model.)

J. S. ORAM.

MACHINE FOR DRIVING BARREL HOOPS.

No. 411,832. Patented Oct. 1, 1889.

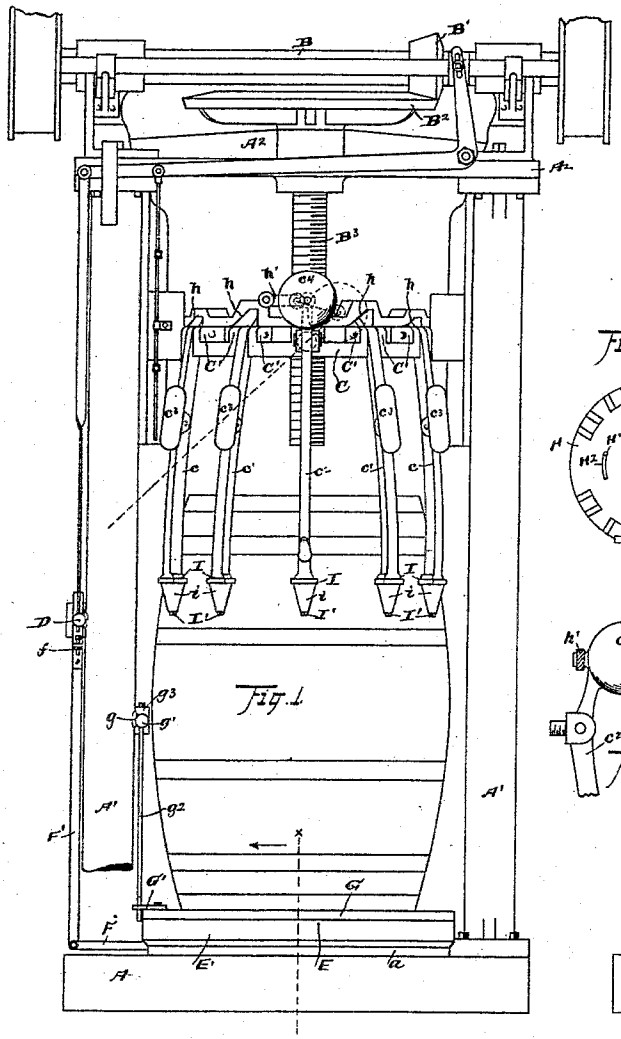

Fig. 1.

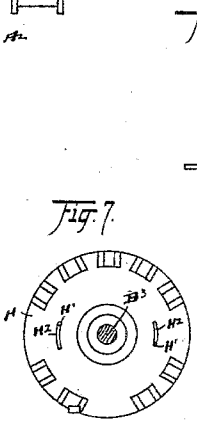

Fig. 6.

Fig. 7.

Fig. 8.

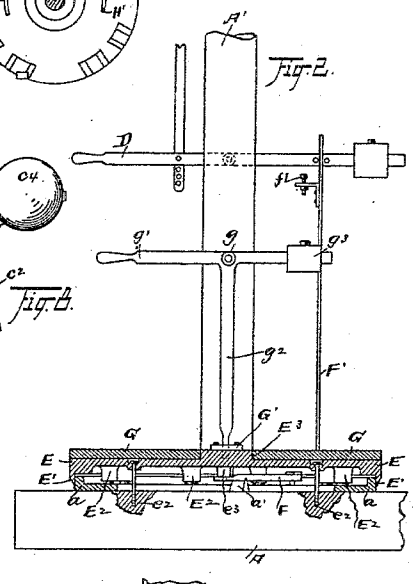

Fig. 2.

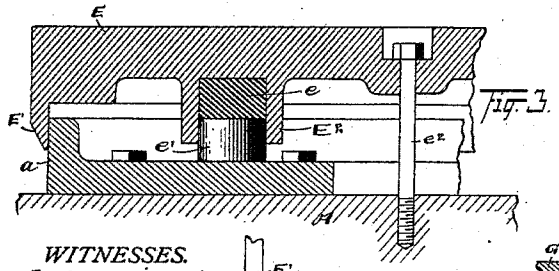

Fig. 3.

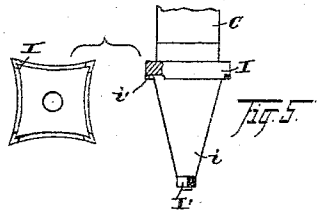

Fig. 5.

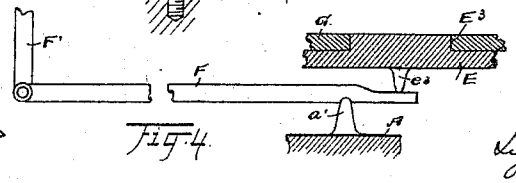

Fig. 4.

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MACHINE FOR DRIVING BARREL-HOOPS.

SPECIFICATION forming part of Letters Patent No. 411,832, dated October 1, 1889.

Application filed January 18, 1889. Serial No. 296,703. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. ORAM, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Driving Barrel-Hoops; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in machines for driving barrel-hoops, in which the barrel rests on a depressible table supported by springs, and so arranged that in driving the hoop whenever a predetermined pressure is applied to the hoop the machine is automatically stopped and reversed.

My invention also relates to the details of construction, hereinafter described, and pointed out in the claims.

Heretofore with this class of machine the pressure on the hoop has usually been applied by means of a hand-lever manipulated by the operator, who had in a measure to guess at the pressure being applied. The result was that a large number of good hoops were broken by excessive pressure, while other hoops, for want of sufficient pressure, were not driven tight enough. In view of the premises I have devised the mechanism illustrated in the accompanying drawings.

Figure 1 is a front elevation. Fig. 2 is a side elevation, in section, on line *x x*, Fig. 1. Fig. 3 is an enlarged elevation, in section, showing the manner of supporting the depressible table. Fig. 4 is a view, partly in section and partly in elevation, of the bed-plate and table and interposed lever. Fig. 5 is a view in side elevation, partly in section, and a view in plan, of one of the drivers. Fig. 6 is a detached view, in perspective, of the upper portion of rod F′. Fig. 7 is a view in elevation of cam-ring H; and Fig. 8 is a view of upper end of driving-arm c^2, showing the weight c^4 thereon.

A represents the bed-plate, upon which are secured the columns A′, the latter being connected near the top by a heavy cross-beam A^2, these members constituting the frame-work of the machine.

B is the driving-shaft, the same having a beveled pinion B′, that engages a larger gear B^2, the latter being mounted on a vertical screw-rod B^3 of large size. This screw-rod is journaled in the bore of the hub of cross-beam A^2, and the threaded section of the screw-rod engages the threaded bore of the hub of disk C. This disk is provided with gibs that embrace guides on the columns, and screw-rod B^3 has a collar below the cross-beam to hold the screw-rod endwise. The driving-shaft is provided with friction-clutch and mechanism for starting, stopping, and reversing the machine, such clutch mechanism being operated by a hand-lever D.

As the parts thus far mentioned have heretofore been in common use in trussing-machines, no further description of them is considered necessary, except to state that the hand-lever D is moved upward by the operator to start the machine in the direction that forces disk C downward to drive a hoop. The bed-plate is provided with an upwardly-projecting rim *a*, that fits nicely inside the depending rim E′ of table E, these engaging-rims serving as guides for the table. As the bed-plate is large and heavy, it is considered better practice to make rim *a* detachable, so that it can be turned off separate from the bed-plate, to which it is attached by screws, as shown.

Table E has a series of depending hollow lugs E^2, located at equal intervals just inside the rims aforesaid, these lugs being bored and fitted with rubber springs *e* and with followers *e′*, the latter being located outside the springs. These followers are of considerable depth—say two inches, more or less—and rest on the bed-plate, by which arrangement table E is yieldingly supported by the springs. Several studs e^2 pass loosely through holes in the table, these holes being countersunk to admit the heads of the studs flush with or below the surface of the table. These studs screw into threaded holes in the bed-plate, and are screwed down to depress the table and thereby compress the spring to approximately the pressure necessary in driving a hoop, and also hold the table in position and prevent the displacement thereof, the countersink in the top of the table being sufficiently deep to allow the table to be de-

pressed the necessary distance for tripping the gear without coming in contact with the barrel supported on said table.

A lever F serves as a balance-beam, and is located between the bed-plate and table and extends out through slots in rim *a* and E′. This lever is fulcrumed on a lug *a′*, extending upward from the bed-plate, and the lever is engaged on top by a lug e^3, depending from the center of the table. These lugs are located so near together that a slight depression of the table elevates the outer end of the lever some considerable distance. The outer or free end of lever F is connected with an upright rod F′, that extends up along the side of hand-lever D, but rearward of the fulcrum of the latter. Rod F′ is provided with a set-screw *f*, located in position to engage the under side of lever D with the upward movement of rod F′. This set-screw is adjusted accurately to engage the hand-lever just as the table is depressed and the maximum pressure applied to the hoop, such engagement of set-screw *f* with lever D causing the latter to move in the direction to reverse the machine. The pressure applied to the hoop does not, therefore, depend in the least upon the operator, but is automatically regulated, so that each hoop is driven as tight and no tighter than it should be. The result is that no good hoop is broken; but each poor hoop in driving is and ought to be broken. Table E has an upwardly-projecting hub E^3, that serves as a center pin for plate G. The latter rests and may turn upon the table, and the barrel during the hoop-driving rests directly on this plate, suitable adjustable stops being connected with the plate (but not shown) for bringing the barrel centrally over the table.

A T-shaped lever is pivoted at *g* to one of the columns aforesaid, the forwardly-projecting handle thereof *g′* being in such proximity to lever D that the operator can conveniently handle both levers. The rearwardly-projecting member of the lever is weighted, as shown at g^3, and the depending arm thereof g^2 is embraced loosely, for instance, by fingers projecting laterally from plate G, as as shown at G′. With such arrangement of parts, by depressing handle *g′* plate G is turned on its axis in the one direction, and when handle *g′* is released the weight at the other end of this lever returns plate G to its normal position, suitable stops (not shown) being provided to limit the movement of plate G in either direction. If, for instance, in driving the hoop the latter is bent edgewise a trifle, by rotating plate G by means of the hand-lever aforesaid the barrel is turned on its axis so that with a second stroke of the machine the driver strikes the hoop at a point midway between where the drivers engage the hoop at the first stroke.

It will be observed that the mechanism for turning the barrel on its axis is simple and inexpensive, and the two levers for operating the machine are in such relative position that only one operator is required.

Disk C aforesaid is provided with a series of vertical radial slots at the periphery, with ears C′ located on either side of each slot for embracing, respectively, the driver-arms *c* and *c′*, each driver-arm being pivoted to and between a pair of ears, so that each arm may swing in the direction toward or from the barrel. The front-side driver-arm c^2 is pivoted between the prongs of a forked stud, so that this arm, like the other, may swing toward and from the barrel, and by reason of the stud being journaled in a radial hole in disk C the stud may turn on its axis, and consequently arm c^2, when it is drawn back from contact with the barrel, may also be swung laterally, and this arm c^2 is used as a lever for swinging arms *c* and *c′* back from the barrel in placing the barrels on or removing them from the table. The mechanism for accomplishing this is as follows:

On top of disk C is mounted a cam-ring H, the same being concentric with the disk, and the cam-ring being held down to its seat by stud H′, the latter passing through curved slots H^2 of the ring and screwing into threaded holes in disk C. Ring H at the periphery and under side thereof is provided with a series of pockets having inclined walls *h* on the one side thereof. The upper ends or heads of arms *c* and *c′* above the fulcrums thereof extend into these pockets, and when the cam-ring is rotated in the one direction the inclines *h* engage and depress the heads of these arms, whereby the arms below the fulcrums thereof are swung outward or away from the barrel. When the cam-ring is reversed, these arms by gravity move toward the barrel. The only difference between arms *c* and *c′* is that the heads of the latter are longer and the engaging-inclines more abrupt, whereby the two arms *c′*, both located on the front side of the barrel, swing farther away from the barrel to facilitate moving the barrel to and from the machine. The upper end of arm c^2 is connected by link *h′* with the cam-ring H, so that by turning arm c^2 laterally the cam-ring is turned on its axis and the different driver-arms are thus distended. The different driver-arms curve outwardly to embrace the barrel, thus bringing the center of gravity of each arm outside its pivotal bearing, which, together with weights c^3, attached to the respective arms, cause the latter, when left free by the reverse movement of the cam-ring, to gravitate toward the barrel. Arm c^2 has attached on the top and on the outer or front side thereof a heavy poise c^4, sufficient in weight to counterbalance arm c^2 when the latter is turned laterally. When this arm is in a vertical plane, poise c^4 being, as aforesaid, on the outside of the arm is outside of the pivotal bearing of the latter and causes the arm to gravitate toward the barrel.

Drivers I consist each of a hardened-steel plate, usually four-sided. These are respect-

ively secured by means of a bolt or stud I′ to the end of a driver-arm, such securing-bolt also passing through a central hole in an inverted conical washer *i* of considerable length. The driver is adjusted with one edge thereof presenting toward the barrel, and such edge is curved to approximately fit the surface of the barrel. Each driver on the under side thereof is provided with a slight groove *i′*, such groove extending to and running parallel with the contiguous edge of the driver, this groove in cross-section being adapted to receive the edge of the hoop, and by this groove the driver is held firmly upon the hoop. Usually the four edges of the driver are thus provided each with a groove, so that when the one edge of the driver becomes worn by loosening the securing-bolt another edge of the driver can be brought to bear upon the hoop. The four edges of the driver may thus in turn be utilized. The base of cone I extends to the inner edge of groove *i′*, this cone serving as a guide for the driver. Heretofore it has been difficult to drive the chine-hoops by means of a machine, and such chine-hoops have therefore usually been driven by hand. With my improved construction, and the machine having been reversed before cones *i* are drawn entirely above the hoop that is to be driven, the cone, during the down movement thereof, by engaging the hoop guides the driver to its place on the hoop and prevents the driver from chafing the barrel. Under such conditions it will be readily understood that the chine-hoops can be driven with the same facility as the balance of the hoops. Various modifications may be had without departing from the spirit and purpose of my invention. For instance, in place of springs for supporting the depressible table, levers and weights might be employed for the same purpose, but such weights and levers would be cumbersome, and the springs are therefore preferred; also, spiral or other forms of spring might be substituted for the rubber springs shown. In place of handles *g′*, a treadle might be arranged near the floor and connected with this lever, so that the operator could rotate plate G by foot-power.

What I claim is—

1. In a machine for driving hoops, the combination, with a movable table and springs for yieldingly supporting same, of bolts for partially depressing the table and springs and holding them depressed, substantially as set forth.

2. In a machine for driving hoops, the combination, with a movable table, springs for yieldingly supporting same, and bolts for partially depressing the table and springs and holding them depressed, of drivers acting in a direction opposite to the direction of pressure of the springs, substantially as set forth.

3. The combination, with depressible table, substantially as indicated, of plate or false top supported by and adapted to turn on such table, a hand-lever connected with the plate for turning the same on its axis, a counter-balance connected with such lever for reversing the plate, substantially as set forth.

4. The combination, with a series of gravity driver-arms and cam-ring for engaging and distending such arms in opposition to the gravity of such arms, of a driver-arm having a universal fulcrum, a link connecting such arm with the cam-ring, whereby a lateral movement of this arm rotates the cam-ring and causes distention of the other driver-arms, substantially as set forth.

5. The combination, with a series of gravity driver-arms acting in vertical radial planes, a cam-ring for distending and elevating such arms, of arms c^2, having a universal fulcrum, such arm being connected by a link with the cam-ring and having a counter-balance located above and outside the fulcrum thereof, whereby such counter-balance by gravity moves this arm toward the barrel when such arm is in its depending position, substantially as set forth.

6. The combination, with driver-arms, substantially as indicated, of drivers connected with the free ends of these arms, such drivers consisting, essentially, of metal plates set edgewise to and approximately fitting the barrel, each driver having a groove on the under side thereof extending to and parallel with the adjacent edge of the driver, such groove being adapted to receive the edge of the hoop, substantially as set forth.

7. The combination of driver-arms, drivers, and removable and adjustable conical guides located below the drivers, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 9th day of November, 1888.

JOHN S. ORAM.

Witnesses:
CHAS. H. DORER,
ALBERT E. LYNCH.